



U.S. Department  
of Transportation

**Federal Aviation  
Administration**

# Memorandum

Subject: **INFORMATION:** New Policy on the Stowage, Retention,  
and Breakaway of Deployable Individual Video Systems  
(IVS) Installed in Transport Airplane Seats

Date: November 21, 2002

From: Acting Manager, Transport Airplane Directorate, Aircraft  
Certification Service, ANM-100

Reply to  
Attn. of: 02-115-21

To: See Distribution

Regulatory § 25.789  
Reference:

This memorandum is issued as a supplement to memorandum 01-115-32, dated May 30, 2001, which discussed the use of industry standards in the seat certification process and, in particular, qualification of video systems mounted on seats. The intent of that memo was to reduce the regulatory burden on industry by simplifying the certification process for video abuse load testing of video systems deployed from passenger seats. This memorandum will serve to further simplify the certification process by acknowledging the acceptability of test data generated by the seat suppliers pertaining to the retention of video components. This acknowledgment is limited to video components installed by the seat supplier on seats that they manufacture and for which TSO approval, to TSO C39 (latest change) or TSO C127 (latest change), is obtained.

Additionally, this policy statement provides information and guidance regarding acceptable means, but not the only means, of showing compliance with 14 CFR §§ 25.789, 25.785, and 25.813 for certifying retention, breakaway, and stowage of in-seat video systems (IVS) components installed on seats. Deployable IVS typically consist of, but are not limited to, a seat video display, a deployment mechanism, a video and power cable, and an armrest/console.

Three subject areas still need clarification for these seat mounted video components. They are: retention of seat mounted video components, use of a breakaway feature, and stowage. The following guidance addresses the method of compliance, test processes and pass/fail criteria for these components.

## **RETENTION**

**Regulations:** § 25.789(a) – “Means must be provided to prevent each item of mass (that is part of the airplane type design) in a passenger or crew compartment or galley from becoming a hazard by shifting under the appropriate maximum load factors corresponding to the specified flight and ground load conditions, and to the emergency landing conditions of § 25.561(b.)”

**Method of Compliance:** Deployable in-seat video components should be designed so that they remain in the stowed position for the load conditions applicable to the appropriate airplane model in which they are installed. When the component stowage incorporate a latching mechanism, it should be equipped with a distinct visual, audible or tactile indicator which indicates proper engagement of the latch to the person stowing the equipment.

**Acceptable Test Procedure (for forward deploying video components):** The IVS components should be stowed in a manner that ensures proper engagement of the latching mechanism. Test records should document the distinct visual, audible or tactile indication of proper latch engagement. The required test load is calculated by adding the weight of the components and the deployment mechanism (i.e., video display, cable) and then multiplying this combined weight by a 9.0 load factor. Using a hand held load indicator or equivalent, apply a forward load that is equal to or greater than the calculated required test load to the seat components approximately 2 inches from the component edge and hold for 3 seconds. The edge to be tested is the edge that is farthest from the arm pivot point for a component that has a pivot located on the armrest console. This is intended to address video components that are stowed in the forward vertical face of an armrest and that pivot forward and upward when deployed. For other types of forward deploying systems, apply the required forward load through the approximate center-of-gravity (CG) of the component and the deployment mechanism. Test records should document the applied force needed to substantiate the means of retention of the IVS.

**Acceptable Test Procedure (for upward deploying video components):** When the IVS installation incorporates a latching mechanism the IVS components should be stowed in a manner that ensures proper engagement of the latching mechanism. Test records should document the distinct visual, audible or tactile indication of proper engagement if applicable. When calculating the appropriate upward test load, consider the § 25.561(b) loads and the flight, gust, and ground loads for the appropriate airplane model. The required load can be calculated by adding the weight of the components (i.e., video display, cable) and deployment mechanism and then multiplying this combined weight by the appropriate load factor. Using a hand held load indicator or equivalent, apply the appropriate upward load that is equal to or greater than the calculated required test load to the component approximately 2 inches from the component edge and hold for 3 seconds. The edge to be tested is the edge that is farthest from the arm pivot point for the component that has a pivot located on the armrest console. For other types of upward deploying systems, apply the required forward load through the approximate CG of the component and deployment mechanism. When attaching the strap to a monitor, it may be necessary to cut a hole in the armrest cap/cover. Test records should document the applied force needed to substantiate the means of retention of the IVS.

**Pass/Fail Criteria (for upward or forward deploying video components):** The IVS component must remain in the stowed position under the 9.0g forward load or the applicable upward load (the greater of 3.0g upward load of § 25.561(b)(3)(i) or the vertical inflight load of the airplane in which the seat is to be installed), as dictated by the system's design.

## **USE OF A BREAKAWAY FEATURE**

**Regulation:** § 25.785(k) - *“Each projecting object that would injure persons seated or moving about the airplane in normal flight must be padded.”*

**Method of Compliance:** Two acceptable methods for minimizing the injury potential of IVS components are by incorporating padding and/or a breakaway/swivel feature to the component design. When the component uses a breakaway/swivel feature to minimize injury potential, the seat supplier must provide justification that the breakaway load value being used will not present a potential injury hazard in itself. The seat component deployment mechanism need not be padded on a surface, if it can be shown that when a load is applied to this surface, a breakaway/swivel condition would result. A load not exceeding 10 pounds should be applied to a component surface to initiate a breakaway/swivel condition, in order to minimize potential injury.

**Acceptable Test Procedure:** Fully deploy the IVS component. Using a hand held load indicator or equivalent; apply a forward load to the component approximately 2 inches from the edge to initiate the breakaway/swivel feature. The referenced component edge is the edge farthest from the pivot point to initiate the breakaway/swivel feature. Measure and document the force required to initiate the breakaway/swivel feature for the seat video component being tested.

**Pass/Fail Criterion:** The measured force must not exceed 10 lbs.

## **STOWAGE**

**Regulation:** § 25.813 Emergency Exit Access. *“Each required emergency exit must be accessible to the passengers and located where it will afford an effective means of evacuation.”*

**Method of Compliance:** The IVS component, if it deploys for normal use, should be capable of being restowed using nominal force.

**Acceptable Test Procedure (for forward deploying video components):** Using a hand held load indicator or equivalent; apply a forward (or aft) load to the deployed component approximately 2 inches from the edge to cause rotation/swivel to its pre-stowage position. Measure and document the force required to rotate/swivel the video display. Apply a forward (or aft) load to the arm to rotate it to the stowage position. Measure and document the force required to rotate the arm. Some designs may require additional rotations and translations to complete the stowage of the component. Apply, measure, and document the necessary loads in the appropriate directions to complete the stowage of the seat video component being tested.

**Acceptable Test Procedure (for upward deploying video components):** Using a hand held load indicator or equivalent; apply a load to the deployed component approximately 2 inches from the edge to cause rotation to its pre-stowage position. Measure and document

the force required to rotate the component. Apply a load to the arm to rotate or push the arm into the stowage position, depending on the design. Measure and document the force required to rotate or push the arm. Some designs may require additional rotations and translations to complete the stowage of the component. Apply, measure, and document the necessary loads in the appropriate directions to complete the stowage, including latching, of the seat video component being tested.

**Pass/Fail Criterion:** The forces measured independently must not exceed 35 lbs. in any direction.

A statement from the seat manufacturer that the IVS components installed in the seat remained attached and stowed when subjected to the emergency landing loads of § 25.561 and to the specified flight and ground load conditions for the specific aircraft into which the seats will be installed, should be sufficient. This may be a specific statement or encompassed in a more general statement. An example of the latter is as follows: The seat installer (e.g., an airplane manufacturer) includes the text from § 25.789 in its seat interface requirements document (or equivalent) that all seat suppliers must meet, and specifically requires that all deployable IVS items remain stowed. The purpose of that document is to ensure that the seat will meet the requirements of the interface with the airplane. The seat supplier, upon delivery of the seats, should provide a statement to the installer that all of the requirements of the interface document have been met.

On the other hand, if it is the seat installer who actually installs the IVS components, such as the video equipment, into the seats provided by the seat supplier, then analysis or additional testing with additional FAA oversight per FAA Order 8110.4B will be required in order to demonstrate FAR part 25 compliance for the modified seats.

Finally, this guidance material covers compliance for cabin safety issues only. All other applicable certification regulations still apply.

### **Effect of Policy**

The general policy stated in this document does not constitute a new regulation or create what the courts refer to as a “binding norm.” The office that implements policy should follow this policy when applicable to the specific project. Whenever an applicant’s proposed method of compliance is outside this established policy, it must be coordinated with the policy issuing office, e.g., through the issue paper process or equivalent.

Applicants should expect that the certifying officials will consider this information when making findings of compliance relevant to new certificate actions. Also, as with all advisory material, this policy statement identifies one means, but not the only means, of compliance.

Any questions may be directed to Alan Sinclair, ANM-115, at (425) 227-2195.

/s/

Ali Bahrami

<b>DISPOSITION OF PUBLIC COMMENTS ON DRAFT POLICY STATEMENT 02-115-21, RETENTION OF ITEMS OF MASS INSTALLED IN TRANSPORT AIPRLANE SEATS</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Disposition</b>
Air Transport Association (ATA)	Page 2, section "RETENTION" revise as shown: "When the component stowage incorporate a latching mechanism it should be equipped with a distinct visual, audible and/or tactile indicator..." and "Test records should document the distinct visual, audible and/or tactile indication..."	The sentences have been revised.
ATA	Page 3, section "USE OF A BREAKAWAY FEATURE" Comment: If IVS is stowed for takeoff and landing there should be no requirement for a breakaway feature or padding. The IVS would be no more of an injury hazard than other stowable items in the cabin.	Do not concur, the breakaway feature is to protect the occupants (passenger moving about the cabin during normal turbulence.
Civil Aviation Authority of the United Kingdom (CAA UK)	The term "breakaway/swivel" should be defined to ensure that correct interpretation of "breakaway" is understood.	The definition of "breakaway/swivel"
CAA UK	Page 2, the section "Acceptable Test Procedure (for upward deploying video components):" The statement that " The IVS components should be stowed in a manner that ensures proper engagement of the latching mechanism." Assumes that all IVS components have a latching mechanism."	The sentence has been revise as follow IVS installation incorporates a latching the IVS components should be stowed that ensures proper engagement of the mechanism."
CAA UK	Page 2, section "RETENTION" It is not clear what is the purpose of the following "... the distinct visual and/or audible indicator of proper latch engagement."	The sentence was revise as follows: " component stowage incorporate a latching mechanism it should be equipped with visual, audible and/or tactile indicator indicates proper engagement of the latching stowing the equipment."

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Matsushita Avionics System Corp. (MAS) via the ATA	<p>In the paragraphs describing "Acceptable Test Procedures" on retention of items of mass: Ref. 25.789(a). The memorandum draft states "Using a hand held load indicator or equivalent, apply a forward (or upward) load that is equal to or greater than the calculated required test load to the seat components approximately 2 inches from the component edge..."</p> <p>Applying the required test load "approximately 2 inches from the component edge" is not representative of the actual forces involved. The test load should actually be applied at the center of gravity of the rotational mass (i.e., monitor, cable and components of the deployment mechanism that rotate with the monitor) when the Monitor/Deployment Arm is in the stowed position.</p>	While we concur with the statement that the condition is considered to represent the actual forces, it is intended to account for variations in design and to provide a standardized test.
Boeing	Page 1, Subject: Change the title of the policy to: "New Policy on Stowage, Retention, and Breakaway of Deployable Individual Video Systems (IVS) Installed in Transport Airplane Seats"	Concur, title was revised
Boeing	Page 1, paragraph 1: Just before the last sentence in the first paragraph, add the following: "This policy statement provides information and guidance regarding acceptable means, but not the only means, of showing compliance with 14 CFR §§ 25.789, 25.785, and 25.813 for certifying retention, breakaway, and stowage of IVS components installed on seats."	Concur, statement has been added.
Boeing	Page 1, paragraph 1: Change the second to last sentence to read as follows: "This memorandum will serve to further simplify the certification process pertaining to the stowage, retention, and breakaway of deployable video systems on seats for suppliers that have an approved quality control system on file with the FAA in accordance with 14 CFR §21.605 (a) (3)."	The paragraph was revised as follows to address the concern: "This memorandum will serve to further simplify the certification process by addressing the acceptability of test data generated by the suppliers pertaining to the retention of video components. This acknowledgment is for video components installed by the seat manufacturers on seats that they manufacture and for which approval, to TSO C39 (latest change) (latest change), is obtained."

<b>DISPOSITION OF PUBLIC COMMENTS ON DRAFT POLICY STATEMENT 02-115-21, RETENTION OF ITEMS OF MASS INSTALLED IN TRANSPORT AIPRLANE SEATS</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Disposition</b>
Boeing	Page 1, paragraph 1: Change the last to read as follows: “Deployable in-seat video systems (IVS) typically consist of a seat video display, a deployment mechanism, a video and power cable, and an armrest/console.”	The sentence was revised as follows: in-seat video systems (IVS) typically consist of a seat video display, a deployment mechanism, a video and power cable, and an armrest/console."
Boeing	Page 1, paragraph 3: Change the text of this paragraph to read as follows: “If the policy stated here is followed and the Pass/Fail criteria are met, then this type of installation, when done in conjunction with an FAA-approved quality system, could be considered a minor change and can be considered approved as described in §21.95.”	The paragraph 1 on page 1 was revised to address the concern.
Boeing	Page 2, first full paragraph entitled, “Acceptable Test Procedure (for forward deploying video components)”: Delete the sentence that states, “The edge to be tested is the edge that is farthest from the arm pivot point for the component that has a pivot located on the armrest console.”	Do not concur. The requirement is stricken and taken into account various types of installations.
Boeing	Page 2, first full paragraph: Change the second sentence from the end to read as follows: "Apply the required ... ”	Do not concur, see previous comment.
Boeing	Page 2, first full paragraph: Change the last sentence to read as follows: “Test records should document the applied force that substantiates the latching mechanism on the IVS. These test records shall be maintained by the supplier.”	The sentence was revised as follows: Test records should document the applied force and substantiate the means of retention of the IVS components.  The change on page 4, covers the data required for the IVS components installed in the seat to be attached and stowed when subjected to emergency landing loads of §25.561 and a specified flight and ground load condition for the specific aircraft into which the seats will be installed should be sufficient.”



<b>DISPOSITION OF PUBLIC COMMENTS ON DRAFT POLICY STATEMENT 02-115-21, RETENTION OF ITEMS OF MASS INSTALLED IN TRANSPORT AIPRLANE SEATS</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Disposition</b>
Boeing	Page 2, paragraphs 2 and 3 (concerning acceptable test procedures for upward deploying video components and pass/fail criteria): These paragraphs should be revised to indicate that the new policy statement does NOT address upward deploying video systems that do not have a latch (reference FAA letter 98-120S-368, dated August 21, 1998). While this method of compliance requires an installation-level review, if this method is to be used, the seat/IVS at the component level needs to be designed to meet the requirement and can be covered in this policy.	Revised the first sentence of paragraph 2 to read: "When the IVS installation incorporates a latch mechanism the IVS components should be designed to meet the requirement and can be covered in this policy."
Boeing	Page 3, paragraph 1 (Use of Breakaway Feature - Method of Compliance): Revise this paragraph to include a third method of compliance that was approved by Issue Paper CI-20 (reference letter 100S-01-12, dated January 25, 2001).	Issue paper are by design project specification. Change to Page 1, paragraph 1: "This statement provides information and guidance regarding acceptable means, but not the only means, of showing compliance with 14 CFR 25.785, and 25.813 for certifying retention of breakaway, and stowage of IVS components on seats." Should be adequate to address additional methods of compliance that may wish to use.
Boeing	Page 3, paragraph 6 (Stowage - Acceptable Test Procedure): Change the last sentence of this paragraph to read as follows: "... necessary loads in the appropriate directions to complete the stowage, including latching, of the ... "	Concur sentence has been revised.
Boeing	<u>Page 4, second full paragraph</u> : Change the first sentence to read as follows: "A statement from the seat manufacturer that the IVS components installed in the seat remained attached and stowed when subjected (1) to the emergency landing loads of §25.561 and (2) to the specified flight and ground load conditions for the specific aircraft into which the seats will be installed, should be sufficient."	The sentence was revised.  NOTE: The results should be documented and made available to the FAA upon request. It is the responsibility of the installer to ensure the installation is in compliance.
Boeing	<u>Page 4, paragraph 3</u> : Change the text to read as follows: "By the same token, this policy applies if the seat installer physically installs the IVS components, such as the video equipment, into the seats provided by the seat supplier, if the installer has an FAA-approved quality system on file."	The paragraph 1 on page 1 was revised to address this concern.

